

## Traffic crash absorber

The invention relates to a traffic crash absorber according to the preamble of claim 1. The term "traffic crash absorber" relates to an impact-absorbing element which is used as a combined 5 separating element and an impact absorber for collisions, for the location at roadways which are used by motorized vehicles, particularly cars. In addition, it can have a marker function.

### Background

In certain situations, e.g. during road construction and during the clearing up after an accident, it 10 is necessary to direct the traffic along temporarily changed roadways. For this purpose, conical elements of rubber or plastic are often lined up on the roadway near to this. These conical elements, which mainly serve as warning elements, are relatively light and are of a low height. In this way, the conical elements provide no protection to persons on the inside of the elements, in relation to the roadway, e.g. road construction workers.

15 To increase the safety of persons in a road traffic situation like this, mobile traffic crash absorbers are proposed in SE patent publication 502 091, which are manufactured from vehicle tires which are stacked together and at least partly joined, and which are manufactured with the disk-shaped annular sidewall parts from vehicle tires. The mentioned tire parts consist, according to an embodiment, of the profile section (the central part) and one of the two sidewall parts (side part) of 20 a vehicle tire. The annular cavity which is bounded by a tire – i.e. of its central part and the sidewall part – is partly or completely filled by separated, disk-shaped sidewall parts which are separated from the vehicle tires and which have an outer diameter which fits the profile part of a cover part.

The traffic crash absorber according to SE patent publication 502 091, in which the tire parts with 25 the arranged sidewall sections are mutually connected by means of multiple threads which each – with basis from the tire part at the bottom – is arranged sling-shaped through areas of the tire parts, and which is taken out at the upper tire part. The two ends of the thread forms a fastening device for belts or similar, which provides the holding of the entire device together.

A disadvantage of the prior art traffic crash absorber is firstly, that the manufacturing takes a long 30 time and is relatively difficult, as the said thread must be arranged in a relatively complex sling movement through the actual parts of the tire parts. A further disadvantage of this traffic crash absorber is that it has no fastening that can prevent the traffic crash absorber from rolling, e.g. when hit.

The most serious disadvantage with this traffic crash absorber is, however, the low impact absorbing ability, and the problems with obtaining a secure linkup.

35 Finally, the traffic crash absorber according to SE patent publication 502 091, is neither providing protection for persons located behind the traffic crash absorber, nor is it able to carry a traffic sign, a reference sign, or similar.

From US patent publication 3 848 853 (Way et al. 1974) it is known to provide a traffic crash absorber where several vehicle tires are stacked and fixed together with fastening bolts which extend axially through abutting tire sides. This configuration provides a traffic crash absorber which has too low absorption ability at collision. Besides, it is not suitable for the mounting of traffic signs  
5 and similar.

From US patent publication 5 613 798 (Braverman 1997) it is known to use a vehicle tire as a base for a telescopic columnar traffic marker. This base has low absorption ability, and is exposed to damage by collision. Neither can it serve as a carrier for traffic signs.

From US patent publication 5 645 368 (Yunik 1997) it is known to fasten several rows of stacked  
10 vehicle tires by joining a base plate and a covering plate. Each vehicle tire is covered by a cover. This increases the construction costs and makes it less stable. Here the absorbing effect is satisfying, but with the sacrifice of mobility, which is important at a temporary facility.

From GB patent application 2 303 396 (Roadtex 1995) it is known to fasten a traffic sign to a sleeve which is carried by a spider fastened to two vehicle tires being joined. The joining of the tires  
15 is unstable and the absorbing effect is low.

### Object

The main object of the present invention is to provide a traffic crash absorber having better functional properties than the generally used traffic crash absorbers.

20 The novel traffic crash absorber should also be easily connectable in groups of several traffic crash absorbers, so that more extensive absorbing structures for use at roadways can be created. It is desirable that a linkup like this, of several traffic crash absorbers, has a high absorption ability for collision, so that they can be used in an effective manner in current traffic and provide protection, both for the vehicles and persons, and objects located in the area to be protected by the traffic crash  
25 absorbers.

It is a further object to provide such a traffic crash absorber which can be manufactured in a simple and quick way.

Further, it is an object to provide a traffic crash absorber which as far as possible is manufactured of cheap materials, which are easily accessible.

30 A further object is to provide such a traffic crash absorber which does not roll when hit.

Finally it is an object to provide a traffic crash absorber which, in a simple way, may serve as a carrier for a traffic sign, a reference sign or similar.

### The invention

35 The invention is described in claim 1. Various features and details of the invention are described in the remaining claims.

The invention provides a traffic crash absorber having particularly favourable utilisation properties. The combination of a low centre of gravity, high mass, and solid fastening by linking up, has provided a traffic crash absorber which has substantially improved properties compared to prior art absorbers.

5 The design of the connection elements, as described in claim 3, provides particularly good properties at collisions.

Further, the invention makes it possible to combine the favourable properties of a traffic crash absorber with the function of carrying traffic signs or similar, by means of the features described in claims 6-8.

10 Further features and details of the invention will appear from the description of examples.

### Example

The invention will be described in more detail with references to the drawings, wherein:

Figure 1 is a perspective view of an embodiment of a traffic crash absorber according to the invention,

15 Figure 2 is a sectional side view of the traffic crash absorber of Figure 1,

Figure 3 is a plan view, seen from above, of the traffic crash absorber of Figures 1 and 2, and

20 Figure 4 is schematic sectional view, seen from above, of the three joined traffic crash absorbers according to Figure 1.

Figures 1-3 shows an example of a traffic crash absorber 11 according to the invention. It is assembled of three vehicle tires, particularly used ones, which are stacked with a common, generally vertical axis, consisting of a lower vehicle tire 12 for support against the ground, a central vehicle tire 13 and an upper vehicle tire 14.

25 The lower vehicle tire 12 has a downward facing tire side 15, and a cut away tire side which provides an extended upwards facing opening 16 which extends towards the edge of the tire side surface. The central vehicle tire 13 has a corresponding downwards opening 17 and an upwards facing tire side 18, which forms a support against the complete upper vehicle tire 14, which has a lower tire side 19 and an upper tire side 20.

30 The three vehicle tires 12-14 are held together by four bolts 21, 22, 23, 24 (Figure 4) which extend from the underside of the lower vehicle tire 12 and above the lower tire side 19 of the upper vehicle tire 14. The cavity between the two tire sides 15 and 19 are filled with rings 25 of tire sides which are cut from used vehicle tires. The bolts 21-24 are fixed by an upper nut 26 which presses a sleeve 27 against the tire side 19. At two of the bolts 21, 22, the end of an arm 28, 29 respectively, 35 is held between the nut 26 and the sleeve 27. The arms 28 and 29 form a mutual angle of 90°, and jointly carry a vertically arranged tubular sleeve 30 which connects them. The tubular sleeve 30

may serve as a holder for a traffic sign or similar. For fastening of a traffic sign with a tubular support bar, this is guided through the tubular sleeve 30, and it has a lock screw 31 on the side.

Between the lower vehicle tire 12 and the central vehicle tire 13, a triangular bar bail 32 is arranged, where a side 33 extends inside the traffic crash absorber 11, between and beyond two of the bolts 21-24, and the two other sides 34, 35 join to form an outer bail part 36. The bail part 36 partly serves as anti-roll securing in case one free-standing traffic crash absorber, according to the invention, should be hit or tip over. The bail part 36, besides serving as a link for several traffic crash absorbers adjacent each other, is shown in Figure 4. This is done by a locking element 37. Each bar bail 32 has ends, joined by welding as shown by numeral 38 (Figure 4).

As the lower part of the traffic crash absorber 11 is filled with tire sides 25, the stability and the ability of energy absorption during collision is increased, due to increased mass. All joining elements, with the exception of the protruding bail part 36, are arranged inside the outer surface of the traffic crash absorber 11, which provides protection against damages during collision, breakaway etc.

Except for the bolts the annular sleeve with the arms, and the two triangular bails, waste materials, which generally would provide recycling or destruction problems, can be used. The traffic crash absorber, according to the invention, provides better utilization of used vehicle tires than prior art solutions, which also have inferior properties.

The most important advantage of the invention is the possibility of combining high absorption abilities and a safe linkup. A linkup of traffic crash absorbers, according to the invention, has been tested by the collision of a vehicle with a weight of 1700 kg, and a speed of 70 km/hour, without failure and with satisfying absorbing properties.

It is possible to provide different modifications of the details shown in the example above. For example, it is possible to stack more than three vehicle tires and connect them by the described method. A traffic crash absorber according to the invention is characterised by simple and quick manufacturing, and the possibility of performing a simple repair or reconstruction.